

action which produces variations in the earth's magnetic force affects the conditions of the atmospheric gases, introducing forces which we cannot, in the present state of our knowledge, appreciate, though the facts appear to me to prove their existence."

10. Dr. A. Schuster has shown, from an investigation into the relevant periods, that what have been considered to be good wine years in Germany have closely corresponded with minima of spot. Thus the years when spots were least prevalent were . 1810-5 (that is, midway between 1810 and 1811), 1823-2, 1833-8, 1844, 1856\*2 and 1867-2, while the coincident years of excellent vintages were 1811, 1822, 1834, 1846, 1857-8 and 1868. Since the quality of the grape depends upon abundant sunshine, it is observed that this condition is fulfilled during a minimum period of spots, when the entire area of the photosphere which constitutes the source of heat is the least riven with the rents and cavities which sunspots mean.

11. The inquiry is most interesting whether any causal relation subsists between a prosperous or adverse condition of harvests and crops (especially of wheat) and the frequency or infrequency of spots. The original and penetrating mind of Sir W. Herschel arrived at the conclusion that years of diminished spots coincided with years when the price of corn was low, while the price was increased when the area of spots became augmented, so that the fewer the spots, he concluded, the more favourable was the influence of the solar rays upon the growth of crops. This appears reasonable (though actual observations should be substituted for *a priori* considerations) since the years of least numerous spots are years of more continuous and equable sunshine and heat in consequence of the photosphere then possessing a uniformly unrent surface. This connection, if established, would concur with the statement relating to superior vintage

years.

12. This suggestion naturally leads to the important investigations of Professor Stanley Jevons into the relation between commercial crises—one of the phases presented uniformly by the course of trade—and the sun's condition as manifested in the form of periodic spots. From an exhaustive examination of records Professor Jevons has found that the chief corn-